

AMENDMENTS TO THE CLAIMS

Please cancel claims 1, 14, and 15 without prejudice.

Please amend claims 2, 10, and 12, as below:

Please add *new* claims 16-18, as below:

1. (Canceled)

2. (Currently amended) The detector of claim 16 +, further comprising an expansion chamber for accommodating volumetric expansion of the liquid scintillation material.

3. (Previously presented) A flexible scintillation-type radiation detector for use in combination with a source of nuclear radiation as a level sensing gauge, comprising:

an elongated flexible tube having first and second closed ends and defining therein a scintillation chamber;

liquid scintillation material substantially filling the scintillation chamber;

said first closed end including a substantially optically-transparent first end closure member;

photodetection circuitry operably positioned relative to the first end closure member to quantitatively detect scintillating photons generated in the scintillation liquid indicative of radiation passing into the scintillation chamber;

an opaque, flexible protective sheath substantially surrounding the flexible tube;

further comprising an expansion chamber for accommodating volumetric expansion of the liquid scintillation material; and

wherein a slidable piston member is operably positioned in the scintillation chamber to define a variable volume expansion chamber free of liquid scintillation material adjacent to the second end.

4. (Original) The detector of claim 3, further comprising a stiffener to maintain a portion of the scintillation chamber in which the piston slidably moves to substantially prevent bending thereof.

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5. (Original) The detector of claim 3, further comprising a spring positioned to bias the piston toward the scintillation liquid.

6. (Original) The detector of claim 2, wherein the expansion chamber has a fixed volume and is in fluid communication with the scintillation chamber.

7. (Original) The detector of claim 2, wherein the expansion chamber has a variable volume, the chamber being external of and in fluid communication with the flexible tube and including a movable wall therein.

8. (Previously presented) A flexible scintillation-type radiation detector for use in combination with a source of nuclear radiation as a level sensing gauge, comprising:

an elongated flexible tube having first and second closed ends and defining therein a scintillation chamber;

liquid scintillation material substantially filling the scintillation chamber;

said first closed end including a substantially optically-transparent first end closure member;

photodetection circuitry operably positioned relative to the first end closure member to quantitatively detect scintillating photons generated in the scintillation liquid indicative of radiation passing into the scintillation chamber;

an opaque, flexible protective sheath substantially surrounding the flexible tube; and

an expansion chamber for accommodating volumetric expansion of the liquid scintillation material;

wherein the expansion chamber has a variable volume, the chamber being external of and in fluid communication with the flexible tube and including a movable wall therein; and

further comprising a spring means positioned to bias the movable wall toward the liquid scintillation material.

9. (Previously presented) A flexible scintillation-type radiation detector for use in

combination with a source of nuclear radiation as a level sensing gauge, comprising:

an elongated flexible tube having first and second closed ends and defining therein a scintillation chamber;

liquid scintillation material substantially filling the scintillation chamber;

said first closed end including a substantially optically-transparent first end closure member;

photodetection circuitry operably positioned relative to the first end closure member to quantitatively detect scintillating photons generated in the scintillation liquid indicative of radiation passing into the scintillation chamber;

an opaque, flexible protective sheath substantially surrounding the flexible tube; and

an expansion chamber for accommodating volumetric expansion of the liquid scintillation material;

wherein the expansion chamber has a variable volume, the chamber being external of and in fluid communication with the flexible tube and including a movable wall therein; and

further comprising a member positioned to selectively immobilize the movable wall in a fixed position.

10. (Currently amended) The detector of claim 17 <sup>+</sup>, further comprising a light reflector substantially surrounding the scintillation chamber and within the protective sheath.

11. (Original) The detector of claim 10, wherein the light reflector includes a flexible sheet substantially surrounding the sidewalls of the flexible tube.

12. (Currently amended) The detector of claim 16 <sup>+</sup>, wherein the photodetection circuitry unit includes temperature sensing circuitry that compensates for a shift in the detection of scintillating photons as a result of temperature variation in the detector.

13. (Canceled)

14. (Canceled)

15. (Canceled)

16. (New) A flexible radiation detector used for sensing a level of a product within a container, said detector comprising:

an elongated flexible tubular member that is physically located at a surface of a container, said tubular member having a first closed end and a second closed end, said tubular member having an interior region that is substantially filled with a liquid scintillation material which is sensitive to detecting ionizing radiation, but is not substantially sensitive to detecting radioactive particles;

said first closed end including a substantially optically-transparent first end closure member; and

a photodetection unit operably positioned relative to said first end closure member to detect scintillating photons generated in said liquid scintillation material, which are indicative of ionizing radiation passing into the scintillation chamber;

wherein said photodetection unit determines a level of product within said container, based on a quantity of said detected scintillating photons.

17. (New) The radiation detector as recited in claim 16, further comprising an opaque, flexible protective sheath substantially surrounding the flexible tube.

18. (New) The radiation detector as recited in claim 16, wherein said liquid scintillation material is sensitive to detecting gamma radiation.